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Taming the Hydra: A Triangulation Approach to Assessing an Interdisciplinary Core Curriculum

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**Key Words: Interdisciplinary Core Curriculum; Higher Education Assessment;
Assessment Methods**

Abstract

The development of interdisciplinary core curricula has mushroomed in recent years as the need to accommodate general education to an explosion of knowledge cutting across disciplines and increased global interdependence has emerged. This trend has not been accompanied, however, by new methods of assessment. In this paper we describe the use of triangulation strategies for evaluating interdisciplinary core programs, then present a case study of an assessment plan based on triangulation drawn from experience at our institution. We conclude with some recommendations concerning establishing triangulation assessments of interdisciplinary core programs.

Introduction

Most American colleges and universities have a set of core requirements of all students. Whether set up as a means to promote general education for citizenship or as way to acquire the skills associated with liberal learning, the idea of prescribing courses aimed at delivering a corpus of knowledge across disciplines and inculcating attitudes favorable to learning has a long history (Miller, 1988). The purposes and techniques used in a “core curriculum” have evolved through a variety of theories and circumstances. The establishment of research universities built around increasingly isolated and specialized courses of study - the “majors” familiar today - led to the initial core curriculum experiments at Columbia, the University of Wisconsin, and Harvard in the early part of the last century (Miller, 1988; Fuhrman, 1997). These early experiments, however, were isolated and often unsuccessful. The great expansion in post - secondary education following the massive investments made in the aftermath of World War II led to deterioration in the core programs at many institutions. Specialization within majors, based on practical concerns among students and advancement incentives for faculty built around research records began to consistently erode the place of general education (Miller, 1988). However, it was the combination of economic hard times and and, especially, substantial increases in the 1970’s and 80’s of students unprepared by secondary education for the rigors of collegiate studies that led to a crisis in general education. As Gamson and her associates (1984, 6) point out,

“The word was out in the middle classes that higher education was no longer a growth stock Mediocre students were not interested in their traditional liberal arts subjects either, since they knew that they would have to find themselves a place in the more applied fields like engineering and business.”

It appeared at the time that the entire idea of a core curriculum was in danger of dying on the vine.

That this not only did not happen, but that instead the idea of the core curriculum would regain favor was the result, paradoxically, of the increased complexity and interdependence of both knowledge and the environment where it had to be applied. As disciplines found their fields becoming more fragmented, the idea of developing general courses that would provide the necessary context for maintaining conceptual coherence became more attractive (Lattuca, 2001). Further, the expansion of knowledge at research frontiers began to require more interaction between disciplines than the hierarchical systems used in the infancy of disciplines. These simple systems began to be replaced with more complex conceptions requiring the capacity to “think outside the box” by using conceptual and empirical knowledge drawn from multiple fields of inquiry and using unconventional methods of analysis (Klein, 1995). Environments also began to require such analytical dexterity as well. Increasingly interrelated economies and cultures, fueled by the explosion in communications and transportation technology, began to change the character of the “practical” concerns that had driven earlier generations (Castells, 2000; Miller, 1988).

Faced with these twin dilemmas, American colleges and universities have turned increasingly to the interdisciplinary core curriculum as a solution. General education requirements based on distributional models, while still popular, do not allow the exposure to multiple methods of acquiring knowledge or to the complex context of developing disciplines (Klein, 1995; Klein & Newell, 1997). Further, the need to incorporate preparation for life in an increasingly diverse society has led to greater emphasis on intercultural awareness that is well-suited for interdisciplinary studies (Huber & Hutchings, 2003). Today, interdisciplinary courses and core programs have proliferated in all kinds of post-secondary institutions (Klein & Newell 1997).

Adopting interdisciplinary studies, however, is not without its pitfalls. There are substantial implementation problems caused by the continuation of specialization within disciplines and the lack of change in the incentive structures for faculty (Lattuca, 2001; Gaff, 1997). Further, there are continuing difficulties with integrating the in-depth knowledge acquired by students within disciplines with the more diffuse and complex knowledge associated with interdisciplinary courses (Lattuca, 2001). But perhaps the most daunting problems facing interdisciplinary core programs involves their evaluation.

Evaluation of educational programs is difficult in the best of circumstances. Pertinent issues arise concerning weighing the respective strategies for evaluation, deciding which measurement approaches to use, determining the instruments to use in developing evaluation datasets, choosing between methods of analysis, and making decisions concerning both who will make policy decisions based on evaluations and how those policies will be implemented (Farmer & Napieralski, 1997). All of these issues arise problematically when evaluating courses of even the most limited scope. They become more forbidding when complex interdisciplinary courses or, even more, when an interdisciplinary core curriculum is the object of study.

When our college decided to adopt an interdisciplinary core curriculum in 1999, one of the

main features in the original proposal was the development of methods to assess the program. This paper begins by presenting an outline of the use of triangulation strategies to assess interdisciplinary core curricula. We then describe the interdisciplinary core curriculum adopted at our college. Next, we describe the multi-method triangulation assessment plan that was implemented and some of the problems with it, based on our experience so far. We conclude with a description of the changes already made in the core program as a result of the assessment effort and some remarks we hope will be helpful to others starting on this path in the future.

Triangulation and the Assessment of Interdisciplinary Core Programs

The main difficulty in evaluating interdisciplinary courses, let alone core curricula, follows from the nature of the courses themselves. Evaluating courses in particular disciplines can be handled in a relatively straightforward manner: discipline specific objectives relevant to the subject matter in the course are postulated, reliable assessment methods for the objectives are selected from those in common use in the discipline, and data is collected and analyzed. If correct choices are made at each stage, the final result should be a useful set of assessment instruments for the courses in question.

Interdisciplinary courses defy such a linear approach. Tying particular sections in interdisciplinary courses closely enough to particular subjects defeats the whole purpose of using them. Such courses thrive on the interaction effects of different disciplinary methods and pedagogical techniques. As Field, Lee, and Field (1994) point out, interdisciplinary courses demand a different type of assessment, based on multiple instruments for measuring results and a focus more on the cognitive development of students than on their acquisition of a body of curricular knowledge.

This warning is even more to the point in interdisciplinary core programs. Here the problem of assessment within courses is compounded by the extended time frame. In single interdisciplinary courses, the threats to valid measurement - and therefore assessment - are real enough: interaction between bodies of knowledge, different techniques applied differently by different educators, differences in the interpretations made by students as they seek to cope with a varied curriculum. For interdisciplinary core programs all of these problems are joined by maturation effects, sequence effects (usually, all students do not take all courses in the same order), and the interaction of general knowledge acquired in the core program and specific knowledge from their disciplinary majors. Any assessment strategy for an interdisciplinary core program has to take these considerations had to be taken into account.

Triangulating methods of analysis is commonly recommended to overcome validity problems like these (King, Keohane, & Verba, 1994; Jones & Olson, 2005; Balnaves & Caputi, 2001). The idea is a simple one; when multiple threats to the validity of measures emerge, use multiple sources of data generated by multiple methods of analysis to meet them. If the different measures seem to lead to similar conclusions, then the level of uncertainty in the results is reduced. Conversely, results that do not converge can point to either errors in data analysis and collection or, for assessment purposes, to areas where changes in the processes involved are indicated. Usually a combination of different types of both quantitative and qualitative methods for producing measures is recommended (King, Keohane, & Verba, 1994).

The strategy chosen for evaluating the multidisciplinary core program at our college embraces triangulation for reasons of both theory and necessity. Theoretically, it makes little sense to try to evaluate a program built around multidisciplinary courses with a single set of instruments. Doing so would conceal - not to well - an underlying assumption: that different methods of analysis, sets of disciplinary data, and methods of instruction represent a uniform dimension of general knowledge. This is not only manifestly untrue, but directly counter to the very aim of the core program. Instead, it can be assumed that interdisciplinary courses should result in a variety of streams of knowledge that are combined through intentional learning (Huber & Hutchings, 2003) to derive new and more complex understandings of the way the world works. A triangulation of different assessment methods would be needed to evaluate how effectively the new core program is delivering that understanding.

Triangulation also provides a useful means for combatting the threats to valid assessment mentioned before. It is unlikely that any single method could provide valid, reliable data for an interdisciplinary program extending across a collegiate career. By combining both quantitative and qualitative methods, we plan to generate data that will allow us to take a more nuanced approach to evaluation of the core program. By incorporating quasi-experimental repeated measures of both general examinations and surveys for different outcomes, assessment teams should be able to cross-validate objective assessments of the courses involved (Campbell & Stanley, 1966). Qualitative instruments, also used quasi-experimentally, should contribute their own insights into areas of learning less amenable to objective measurement. Used together these instruments should provide a very rich source of data capable of evaluating the new core program effectively.

The Hydra Appears: Initiating Interdisciplinary General Education

Our college, a Southern liberal arts institution, adopted an interdisciplinary general education curriculum in February, 1999, replacing a distribution core program that had been in place for a decade. A newly inaugurated college president, a new mission statement, and a new academic calendar all helped precipitate this decision.

In his inaugural address in 1997, the college's new president challenged the faculty to prepare an innovative interdisciplinary curriculum which would emphasize service learning and global awareness. To begin this process, he named task forces to explore changes in the college's mission statement, academic calendar, and general education curriculum. By fall of that year a new mission statement had been adopted. The college also decided to replace its quarter based academic calendar with a modified semester (4 - 1 - 4) calendar to begin in 2000-2001. In light of these changes, the curriculum committee was charged to review the current curriculum and to propose disciplinary and general education requirements that fit the college's new mission and calendar.

Research on interdisciplinary curricula indicated that: a) interdisciplinary (or integrative) curricula were becoming more prevalent across the nation (Marsden, 1995); b) campuses that had instituted interdisciplinary components to their curricula were experiencing a revitalization in learning and teaching; and c) the major advantage of interdisciplinary courses is that they integrate knowledge and reduce the "knowledge silos" that exist between disciplines. After comparing schools that had interdisciplinary core programs and those with distributional ones, the

committee compiled a list of proposed outcomes for a new interdisciplinary core program. The committee then defined a model for interdisciplinary courses that was recommended for adoption. That model provided that courses would be planned by teams of faculty members representing diverse academic disciplines, would utilize common texts, syllabi, and evaluation techniques, but would not be team taught.

Throughout the entire process, the curriculum committee attempted to keep the faculty aware of its deliberations. Presentations on interdisciplinary curricula and courses were given by an outside consultant at college retreats in 1997 and 1998. The first presentation of a complete proposal was made in September, 1998. Following an initial debate, the committee also heard questions and concerns from faculty in each of the college's academic divisions. These comments were compiled and common concerns were identified and evaluated. A second proposal was presented to the faculty in December, 1998 at a special faculty workshop. After another round of comments were received, minor revisions were made and a final proposal was presented to the faculty in January, 1999. The whole process was completed with the unanimous vote of approval of the new interdisciplinary core curriculum by the faculty in February, 1999.

Along with the approval of courses, the faculty agreed that the new interdisciplinary general education program would be phased in over a period of four years and that, during that time, there would be a moratorium on changes in the program until assessment methods could be identified. The committee did, however, recommend that the college begin using the Educational Testing Service's Academic Profile test as an instrument to measure the general success of the new general education program. All students beginning the fall semester of 1999 would take the Academic Profile as freshmen and seniors to insure a basis for comparing the effects of the new core program.

Following the approval of the interdisciplinary general education program, teams of teachers were identified and organized to begin planning the integrative core courses. Each team met in workshops to form common syllabi with course descriptions, choose appropriate texts, and discuss matters of pedagogy. Based on this experience, some further revisions of the courses were made before implementation in the fall of 1999. The next three years were dedicated to working out the inevitable personnel, scheduling, and pedagogical problems involved with putting the new courses in place.

Taming the Hydra: Assessing the Interdisciplinary Core Curriculum

Objectives and Assessment

In Fall 2002, the Dean of the College gathered together various key players in the core program to begin the assessment process. The four-year moratorium on changes to the program had ended, and now it was time to see if the interdisciplinary core was accomplishing its objectives. This was no small task. The only program-wide assessment instrument that had been used during the first three years was the Academic Profile. It was obvious from both experience with the new core program and from the professional literature on interdisciplinary assessment that several different assessment measures would have to be used. A core assessment team was formed and began looking at various measures used by other schools. Before long, however, it

became clear that before any core assessment plan could be developed, there had to be a restatement of the program's objectives.

The original core objectives formulated in 1998 proved impossible to assess meaningfully. Due in part to inexperience with writing more general objectives and in part because of the need to reassure faculty that different aspects of the old distributional core curriculum would be addressed in the new order, these objectives were program-centered (i.e. focused on course structure) and too narrowly based on disciplinary concerns. It quickly became clear that what we really wanted to discover was if our students were leaving us as changed people because of their core experience. That, in turn, meant it was necessary to redefine the objectives of the core program to emphasize student outcomes.

During December, 2003, the assessment team met to finalize new, student based core outcomes. The original core objectives were reduced to four student outcomes designed to assess how the college's students have changed after they have completed the entire core program. Specifically, after completion of the core program, students should be able to:

- 1) Gather, interpret, and evaluate information to make decisions and solve problems creatively;
- 2) Communicate clearly, both orally and in writing;
- 3) Interpret and evaluate the influence of historical, cultural, and religious developments upon human experience; and
- 4) Establish personal values and apply them in service to community.

Methods of Assessment

These outcomes are all potentially assessable, but here the adoption of a triangulation strategy became increasingly necessary (King, Keohane, and Verba, 1994; Field, Lee, & Field, 1994; Farmer & Napieralski, 1997). It was clear that there were many possible assaults to a valid assessment of the new outcomes. First, while the core program is built around a set of interdisciplinary courses, not all parts of the core are interdisciplinary. Obviously, this means that some courses could be best evaluated with more discipline-specific instruments. It also means, however, a possible contamination of assessment results for the interdisciplinary courses by outcomes due to the distributional aspects of the core program. Second, unlike the distributional core program that preceded it, the new interdisciplinary courses in the core are cumulative in character. Consequently, in addition to having more immediate feedback from specific instruments, assessment of the new core would have to be cumulative as well. Measuring outcomes over time, however, meant that maturation effects had to be kept continuously in mind. Finally, some of the new core outcomes can only be assessed as students graduate. It is virtually certain by that time that the choice of a particular discipline as a study major would have an effect on any final outcomes reported.

Trying to overcome all these obstacles is impossible; some aspects of all of them will no doubt contaminate the methods used and the resulting assessments. Ameliorating their effects is possible, however, by applying the triangulation practice of using multiple instruments of assessment and building sequential tests into the final scheme. The team decided on four different methods of assessment administered at different points in the curriculum. The final assessment

scheme can be found in Table 1.

Table 1
Evaluation Instruments by Outcome and Year of Application:
Objective Test Survey Portfolio Exit Interview

Core Outcome 1: Interpret and evaluate information to make decisions and solve problems appropriately				
<u>Freshman</u>	<u>Sophomore</u>	<u>Junior</u>	<u>Senior</u>	<u>Post Graduate</u>
Academic Profile		Academic Profile		
Math Placement Test		Quantitative Reasoning Final		
Cornerstone Lab Test		Dimensions of Well Being Final		
				Recent Graduate Survey
			Exit Interview	
Core Outcome 2: Communicate clearly, both orally and in writing				
<u>Freshman</u>	<u>Sophomore</u>	<u>Junior</u>	<u>Senior</u>	<u>Post Graduate</u>
Academic Profile			Academic Profile	
NSSE*	NSSE	NSSE	NSSE	
				Recent Graduate Survey
Ethical Explorations Paper (Cornerstone)		Ethical Explorations Paper (Humanities II)		
		Exit Interview		
Core Outcome 3: Interpret and evaluate the influence of historical, cultural, and religious developments upon human experience				
<u>Freshman</u>	<u>Sophomore</u>	<u>Junior</u>	<u>Senior</u>	<u>Post Graduate</u>
Academic Profile			Academic Profile	
				Recent Graduate Survey
Ethical Explorations Paper (Cornerstone)		Ethical Explorations Paper (Humanities II)		
		Exit Interview		
Core Outcome 4: Establish personal values and apply them in service to the community				
<u>Freshman</u>	<u>Sophomore</u>	<u>Junior</u>	<u>Senior</u>	<u>Post Graduate</u>
NSSE	NSSE	NSSE	NSSE	
				Recent Graduate Survey
Servant Leadership Paper (Cornerstone)		Servant Leadership Paper (American Experience)		

*National Survey of Student Engagement

Objective Testing. The first assessment method, objective testing, was already partially in place. The Academic Profile test had been employed since the onset of the interdisciplinary core program. The Academic Profile is designed to measure students's basic knowledge, critical thinking, and problem-solving abilities. As such, it is well suited for helping assessment of the

first three core outcomes. At our college, students take the test as freshmen and then again as seniors. This pre-core/post-core comparison allows us to assess where students begin and where they end. Needless to say, the results of the Academic Profile are not conclusive as evaluative instruments; there is substantial knowledge picked up in other courses, both elective and major, that is measured here. Still, if enough basic knowledge and, especially, its critical application is acquired by students in the interdisciplinary core, the test is potentially useful when used in conjunction with other instruments.

To better assess students's mathematical and logical reasoning skills, an important part of Outcome 1, we took advantage of an already existing situation. All incoming freshmen take a math placement test at the beginning of their first year at the college to determine placement into required mathematics sequences. This enabled us to form a natural quasi-experiment for evaluating these skills. The mathematics placement test will be revised to include several questions testing prior skills in this area. Similar questions will then be embedded in the final examination for the required quantitative reasoning course. An analysis of these scores should provide adequate data for evaluating this part of the core program.

Assessing progress in decisions concerning personal health and behavior can be approached similarly. The dimensions of well being course is designed to help students develop healthier habits in all areas of their lives. As part of the core curriculum's freshman cornerstone class, students reflect on the effects of personal habits on their well being. As before, questions given during these exercises will be recapitulated during the final examination for the dimensions of well being course. Again, capturing data at two different times allows a species of experimental comparison that contributes to assessing acquisition of decision-making skills in these subjects.

Surveys. As with objective tests, our college was already administering several surveys that could be used for assessing the core program. The college is part of a national consortium administering the National Survey of Student Engagement (NSSE). NSSE seeks to assess student engagement in a variety of areas: college activities, educational and personal growth, and opinions about the student's school (Kuh 2004). Two of these are of particular use for assessing the new core program. The NSSE college activities scale has pertinent questions about the kinds and difficulty of assignments in classes. Many of these are directly relevant to the increasing competence in written and oral communication relevant to Outcome 2.

The NSSE also includes some pertinent questions concerning the incidence complexity of educational experiences. Prominent among these are responses about the use of service learning and other community-based learning (internships, learning communities, ect.) that are relevant to the goal of fostering the establishment of personal values and their application in the community. These aspects of the NSSE provide data useful for assessing Outcome 4.

The NSSE has another important role in the assessment plan. One of the major threats to valid assessment of the core program is the interaction between general knowledge conveyed by the core program and the particular knowledge acquired in major disciplines. Since the NSSE is given every year to a sample of students, it allows a comparison of student outcomes between those years (freshman and sophomore) when the interdisciplinary core program is a major part of class commitments and those (junior and senior) where studies in particular disciplines begin to predominate.

The college also sends a recent graduates survey to alumni. The survey asks questions that

can provide information about the application of the the values and knowledge gained in interdisciplinary general education to the lives of the college's graduates. A comparison of these results to those obtained during the collegiate careers of students should tell us much about the long run effects of the core program.

Portfolios. Objective instruments have a prominent place in the assessment plan our institution adopted, but they are by no means conclusive. Many aspects of the interdisciplinary general education program cannot be fully evaluated without more qualitative data. The use of student portfolios is the first of these qualitative sources. Again, we have sought to use the structure of the courses over time to build comparative data that can be used to assess multiple outcomes.

During their freshman cornerstone class, students write two major papers, one on ethical exploration and another on servant leadership. Both are reflections demanding that students use the material presented in class and their own experiences to react to ethical situations, both individually and in the community. These papers are then recapitulated in later courses. During the completion of the second half of the humanities sequence, students will write a second ethical explorations paper drawing on their additional educational experiences. During the core course in the American experience, students will also be asked to write a paper on their reaction to servant leadership initiatives offered in their education. These papers will be evaluated independently, compared, and used to assess increases in communication skills (Outcome 2), ability to interpret cultural developments on human history (Outcome 3), and the establishment of a servant leadership ethic (Outcome 4).

The portfolio method of assessment presents a major logistical challenge. First, the collection and storage of papers assigned at different times in each year before they are evaluated presents real difficulties, especially as privacy concerns have become more important. To overcome these difficulties, the documents are stored electronically. Students e-mail their professors a copy of their papers as part of the assignment. The professors then forward them on to a central database. A database application assigns codes identifying each paper by identification number, semester and year, and course.

The second problem involves the actual evaluation of the papers themselves. Since this is a qualitative exercise, relevant coding methods for the papers must be developed. A panel of the faculty will be established and trained in the methods finally decided on. Since this will be a time consuming endeavor, members of the panel will be paid for their work. Coding by faculty is to be complemented by coding using content analysis applications. The comparison of results from both analyzes allows the triangulation of qualitative studies necessary to assure cross-validation of the conclusions drawn from the data.

Exit Interviews. The last element of the general education program assessment is also qualitative: the senior exit interview. Here focus groups comprised of 8 - 10 students, randomly selected from the senior class, are asked questions in a wide-ranging, open-ended interview aimed at gaining insights into the effects of the core program. In the spring semester of each year students are invited to interviews conducted by two trained faculty, one of whom would serve as moderator and the other as transcriber of the discussion. The moderator asks students about their experiences in the core program classes. More specifically, the exit interview includes guided discussions aimed at assessing critical responses by the students to ethical questions and artistic

works. Their assessment of the value of the core program and of particular courses they have taken is elicited as well.

Although questions might vary from year to year, all focus groups conducted within a given year would be asked the same battery of questions. At the end of each group discussion, students would be offered an additional opportunity to make suggestions for improving the general education program. The responses will be recorded and content analyzed for comparison to other data streams.

The Pilot Year

The Dean of the College has designated 2004-2005 as the pilot year for implementing the triangulation assessment plan. We are now well into the project. The assessment process has gone relatively smoothly considering the large task we have undertaken. The Academic Profile Test has been administered to freshmen and seniors as in years before. Professors in Freshmen Cornerstone and Humanities II have collected electronic copies of student papers as requested. Volunteers have already been found for the summer assessment committee who will be reviewing the portfolios. Exit interviews were conducted in the spring semester. The surveys were also administered during this semester. The Chair of the Core Assessment Task Force and the college's Director of Institutional Planning are currently planning the extent of the data analysis that will be attempted in the pilot year.

Difficulties and Shortcomings

The assessment program has, as might be expected, shown some teething problems. Since planning of the details of the program were not finalized until the pilot year had begun, many of the databases needed for a full assessment are not complete. It is unlikely that all of the required portfolio papers have been collected, as some professors may not have understood what they needed to do and students may have neglected to send an electronic copy to their professor. The exit interviews may not be able to draw a representative sample of the senior class. Further, the kind of analysis contemplated of these qualitative data may not be fully realized at first.

These problems are secondary, however, to two more basic difficulties. First, the pre-test/post-test comparisons at the center of the assessment plan would work best if they were conducted on cohorts of students over time. Obviously, this situation cannot be reached until the fourth year of the assessment program. Just as obviously, however, the evaluation of the core program cannot wait. Anecdotal evidence suggests needed revisions, but action that is not driven by systematic data is likely to have unintended and possibly disastrous consequences. At present, the necessary comparisons will be made between particular classes with suitable standardization of the student samples based on SAT scores at matriculation (Mosteller & Tukey, 1977). This step is necessary to insure that rising admission standards between classes do not contaminate the comparisons. Over time, however, this problem will solve itself.

The second difficulty has proven more intractable. The assessment plan is built on assessing the effects of the interdisciplinary core program as a whole. While this makes good sense as an overall objective, it creates a secondary problem of considerable proportions: the evaluation of

particular courses in the core. At present, each of the courses has informal instruments in use that were developed by the core course teams and many of the courses are included in the regular student evaluations administered at the college. So far, however, the problem of establishing more particular instruments for the courses and tying them to the overall core assessment has not been systematically addressed. This will be difficult to do without introducing an element of test fatigue among the college's students. Plans for this stage of the assessment plan remain in their infancy.

Conclusions

The aim of any interdisciplinary program is integrative learning; learning that "... offers students opportunities to see connections as well as differences among disciplines (Huber & Hutchings, 2003)." In today's world this capacity for oversight of knowledge is becoming more and more necessary. Our interdisciplinary core program is intended to foster integrative, intentional learning; learning that is self-directed and aimed at providing the tools for mastering diverse data sources and methods of analysis (Huber & Hutchings, 2003). This paper has described the program itself and, especially, the triangulation based assessment plan that has been developed to evaluate the interdisciplinary core curriculum.

The triangulation strategy has already led to changes, based on its initial results. Scores on the NSSE and data from recent graduate surveys indicated that the freshman cornerstone course was not sufficiently challenging to incoming students. As a result, the cornerstone task force has completely revised the course to increase its rigor to a level more comparable with sophomore core courses. Similar reviews are now being conducted of other freshman level courses in composition and mathematics. Once analyzed, the data collected in the portfolios should help finalize the changes in course design already in train.

We promised at the first a few words of advice for those who might be contemplating use of a triangulation model for assessing interdisciplinary core programs. First, we counsel patience. Often a new curriculum is evaluated as it is implemented. Even if such a course is externally mandated, we believe it should be resisted. A combination of multiple instruments applied to evaluate multiple outcomes over time requires that faculty and students have sufficient experience with the new curriculum to insure against initial, faulty impressions. We might also mention here that working experience with interdisciplinary courses is indispensable for determining the scope and breadth of evaluation efforts. Our plan was carefully calibrated to reduce both faculty effort and student test fatigue by working with existing course requirements and testing instruments. Only our experience with the actual course work itself made this possible.

Second, we counsel boldness. Too often evaluation plans limit their scope to individual courses and the faculty that teach them. This is even the case in core curricula; the forest is often lost for the trees. Adoption of overall outcomes for the interdisciplinary core curriculum at our institution and the use of the triangulation model to evaluate them was a bold step. Whether the effort will succeed over time is still in question. However, we are convinced that the data generated by the assessment plan will provide the basis for a comprehensive evaluation of the core program, a goal often articulated, but seldom achieved. We believe it makes more sense to

plan for an assessment that will provide answers to the vital questions rather than for one that only addresses the feasible ones. Admittedly, this stance may be the result of the planning environment at a liberal arts college; the administrative burdens of the plan we have given here might prove too great at a research university. Still, we think that anything less than an effort to get to the bottom of holistic evaluative questions, in however limited a way, is sacrificing a great institutional opportunity for improvement.

What remains to be seen is whether the plan we describe here will prove a successful model for assessing interdisciplinary core curricula. The process of generating the results and analysis necessary to achieve our own goals is still developing. We anticipate that in the near future we will be ready to discuss a fuller range of triangulated assessment analyses and the actions taken based on them; an evaluation of our evaluations, if you will. That will be the real story.

REFERENCES

- Balnaves, M. & P. Caputi (2001). *Introduction to quantitative research methods: An investigative approach*. Thousand Oaks: Sage.
- Campbell, D.T. & J.C. Stanley. (1966). *Experimental and quasi-experimental designs for research*. Boston: Houghton Mifflin.
- Castells, M. (2000). *The rise of the network society*. Oxford: Blackwell.
- Farmer, D.W. & E. A. Napieralski. (1997). Assessing learning in programs. In J. G. Gaff and J. L. Ratliff (Eds.) *Handbook of undergraduate education*. San Francisco: Josey - Bass.
- Field, M., R. Lee, & M. L. Field. (1994). Assessing interdisciplinary learning. In J. T. Klein and W. Doty (Eds.) *Interdisciplinary studies today*. San Francisco: Josey - Bass.
- Fuhrmann, B. S. (1997). Philosophies and aims. In J. G. Gaff and J. L. Ratliff (Eds.) *Handbook of undergraduate education*. San Francisco: Josey - Bass.
- Gaff, J. G. (1997). Tensions between tradition and innovation. In J. G. Gaff and J. L. Ratliff (Eds.) *Handbook of undergraduate education*. San Francisco: Josey - Bass.
- Gamson, Z. F. et al. (1984). *Liberating education*. San Francisco: Josey - Bass.
- Huber, M. T. and P. Hutchings. (2003). Integrative learning: Mapping the terrain. Carnegie Foundation. Retrieved 26 October 2004, from www.carnegiefoundation.org/elibrary/docs/Mapping_Terrain.pdf.
- Jones, L. F. and E. C. Olson. (2005). *Researching the polity: A handbook of scope and methods*. Cincinnati: Atomic Dog.

King, G., R. O. Keohane, and S. Verba. (1994). *Designing social inquiry*. Princeton: Princeton University.

Klein, J. T. and W. H. Newell. (1997). Advancing Interdisciplinary Studies. In J. G. Gaff and J. L. Ratliff (Eds.) *Handbook of undergraduate education*. San Francisco: Josey - Bass.

Kline, S. J. (1995). *Conceptual foundations for multidisciplinary thinking*. Stanford: Stanford University Press.

Kuh, G. D. (2003). The national survey of student engagement: Conceptual framework and overview of psychometric properties.” Indiana Center for Postsecondary Research and Planning. retrieved 10 January 2005 from www.indiana.edu/~nsse/pdf/conceptual_framework_2003.pdf.

L., Lisa R. (2001). *Creating interdisciplinarity: Interdisciplinary research and teaching among college and university faculty*. Nashville: Vanderbilt University Press.

Marsden, M T. (1995). Politically mainstreaming interdisciplinary programs: A structure for success. *Issues in integrative studies* 13: 59 - 77.

Miller, G. E. (1988). *The meaning of general education: The emergence of a curriculum paradigm*. New York: Teachers College Press.

Mosteller, F. & J. Tukey. (1977). *Data analysis and regression: A second course in statistics*. Reading, MA: Addison - Wesley.